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EUSTREPTOSPONDYLUS

Meat-eating *Eustreptospondylus* probably grew to be about as long as a small elephant.

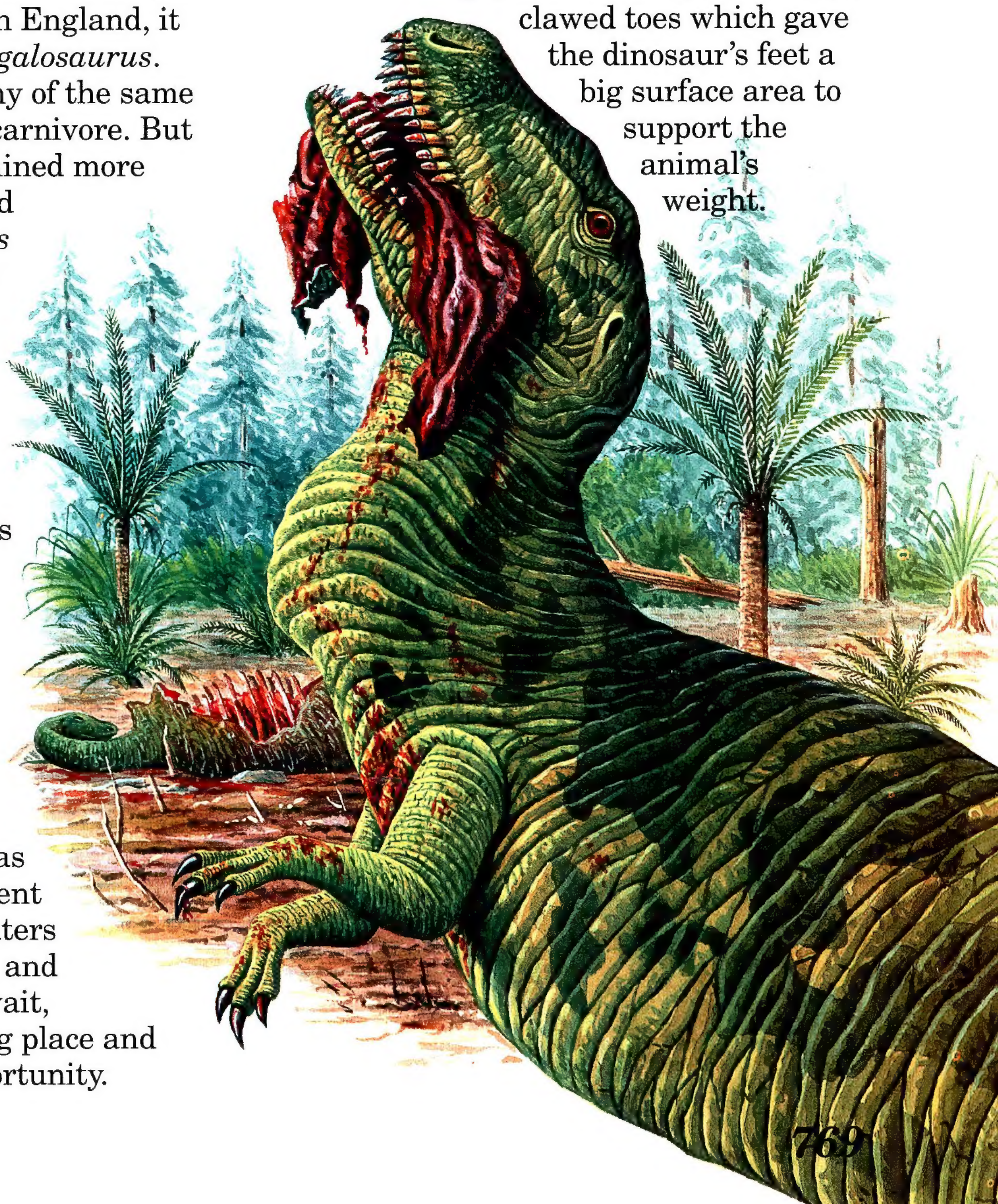
Nobody is quite sure how large *Eustreptospondylus* was because the only fossil found so far belongs to a young dinosaur. When the skeleton of *Eustreptospondylus* was found at Wolvercote, near Oxford in England, it was first given the name *Megalosaurus*. This was because it had many of the same features as that two-legged carnivore. But when the skeleton was examined more thoroughly, an expert decided that it was not *Megalosaurus* after all, and gave it a name of its own.

WARM AND WET

Eustreptospondylus lived in the warm, wet climate of the Jurassic Period. There were many lush plants and ferns. Trees grew taller than ever before and thick forests covered the landscape. It was a great time to be a plant-eater, and there were hundreds of different kinds of herbivorous dinosaurs. This meant that carnivores such as *Eustreptospondylus* never went hungry. As peaceful plant-eaters browsed amongst the plants and ferns, this carnivore lay in wait, ready to leap out of its hiding place and attack them at the first opportunity.

SMALLER AND LIGHTER

Although *Eustreptospondylus* did look like *Megalosaurus* in some ways, it was a smaller and more lightly built dinosaur. Both these dinosaurs walked on two powerful legs which gave them strength and speed. *Eustreptospondylus* had quite a slender body for its size which made it more agile than its heavier relatives. Its huge, muscular legs had large, clawed toes which gave the dinosaur's feet a big surface area to support the animal's weight.



LONG TAIL

Eustreptospondylus had a long tail with flat sides. As it ran, it held its tail stiffly above the ground. This balanced the rest of its body as the carnivore leaped forward to attack an unsuspecting victim. The narrow, tapering tail was streamlined so it did not slow *Eustreptospondylus* down as it sprinted towards its prey.

WEAK BUT DANGEROUS

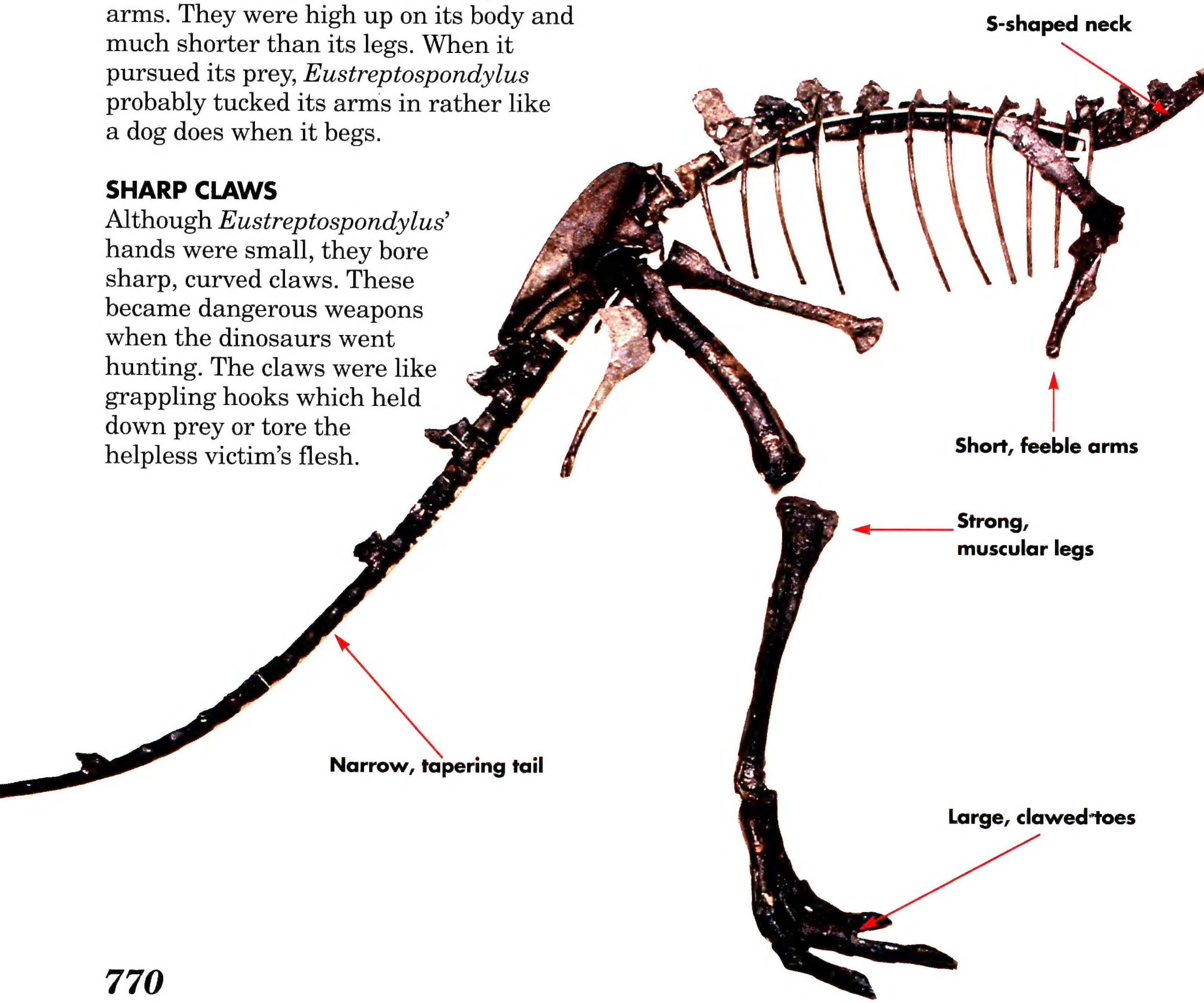
Compared with its extremely powerful legs, *Eustreptospondylus* had very feeble arms. They were high up on its body and much shorter than its legs. When it pursued its prey, *Eustreptospondylus* probably tucked its arms in rather like a dog does when it begs.

SHARP CLAWS

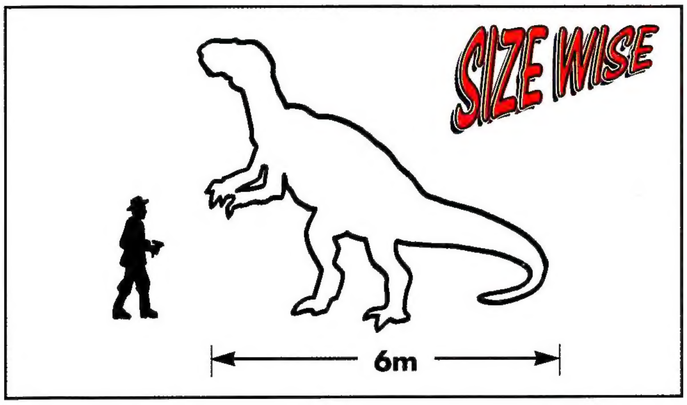
Although *Eustreptospondylus*' hands were small, they bore sharp, curved claws. These became dangerous weapons when the dinosaurs went hunting. The claws were like grappling hooks which held down prey or tore the helpless victim's flesh.

MONSTER FACTS

- **NAME:** *Eustreptospondylus* (yoo-strep-toe-spond-ih-lus) means 'well-curved vertebrae'.
- **SIZE:** up to 6m long
- **FOOD:** meat
- **LIVED:** about 170 million years ago in the Middle Jurassic Period, Oxfordshire, England

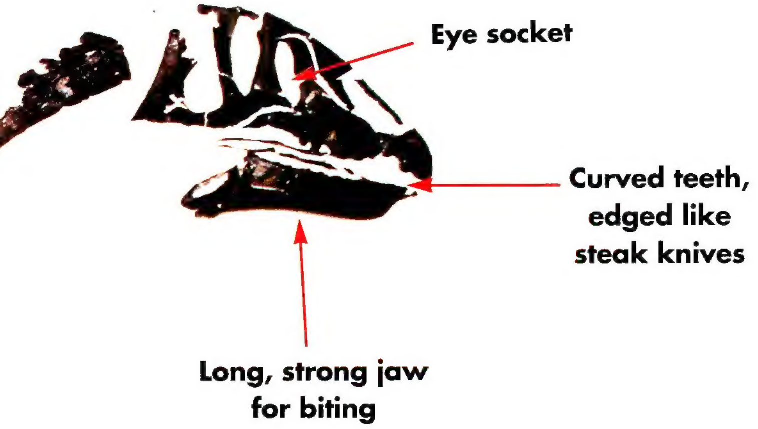


SIZE WISE



Is it true that some dinosaurs gobbled their meat without chewing it first?

Yes. Some carnivores such as *Eustreptospondylus* did not have grinding teeth for chewing. Instead, their teeth had a cutting edge like steak knives. They swallowed huge chunks of meat without chewing at all. You might think they got indigestion from gobbling their food. In fact, it was quite easy for these dinosaurs to digest a meal.


Eye socket
Curved teeth, edged like steak knives
Long, strong jaw for biting

THICK NECKED

Like *Allosaurus*, *Eustreptospondylus* had a thick, S-shaped neck. Its strength and flexibility gave the huge-headed carnivore a great advantage. As it closed its long jaws over its prey, *Eustreptospondylus* pulled and shook its head until the flesh of its victim was ripped away. With curved teeth edged like steak-knives, the carnivore then made short work of its prey, swallowing its meal in huge chunks.

Agile *Eustreptospondylus* was always ready to sneak up on unsuspecting plant-eaters.

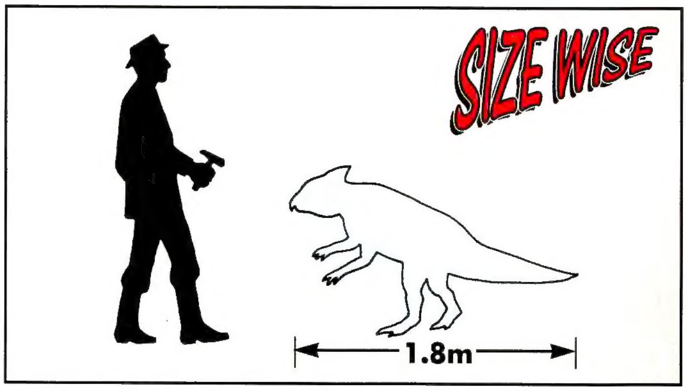
LEPTOCERATOPS

Lively *Leptoceratops* was as long as a giant panda, but only half its weight.

Leptoceratops was smaller and more lightly built than its better known relative, *Protoceratops*. Like *Protoceratops* it had a parrot jaw, powerful jaw muscles and a solid, bony frill.

MONSTER FACTS

- **NAME:** *Leptoceratops* (lep-toe-ser-a-tops) means 'slim-horned face'
- **SIZE:** 1.8m long
- **FOOD:** plants
- **LIVED:** about 75 million years ago in the Late Cretaceous Period in parts of Canada, America and Mongolia



STRONG BACK LEGS

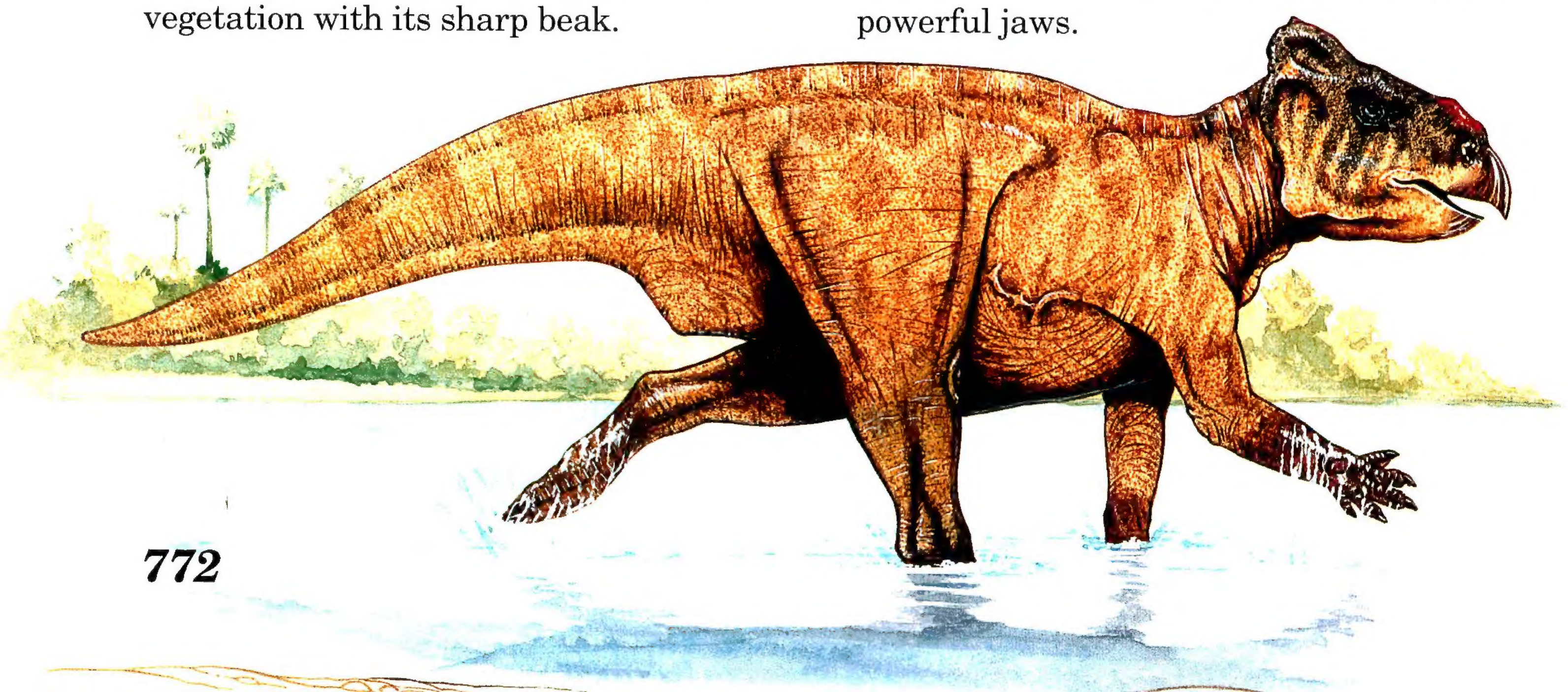
Leptoceratops had long hind limbs. Most of the time it probably walked on two legs, although sometimes it used all four. Standing on its back legs also helped *Leptoceratops* reach branches. When attacked by carnivores, it scuttled away on two legs for greater speed.

PARROT JAWS

Leptoceratops had a parrot-like beak which curved down at the front of its steeply sloping face. It grabbed on to the lower branches of tall trees with its small, grasping hands and then nipped off the vegetation with its sharp beak.

SOLID FRILL

At the back of its skull, *Leptoceratops* had a short, solid frill. Very strong muscles attached to the frill worked the dinosaur's powerful jaws.



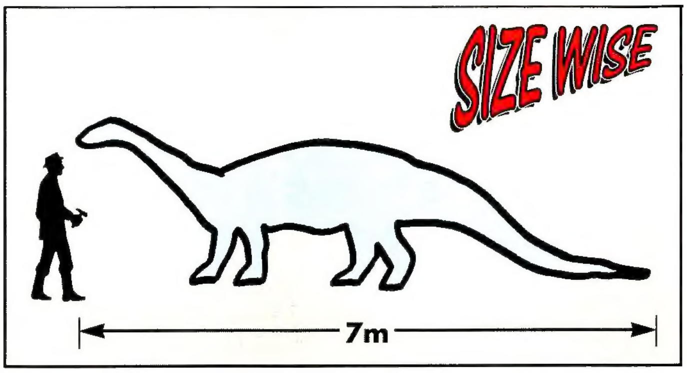
SELLOSAURUS

***Sellosaurus* was a plant-eating ancestor of the giant sauropods.**

Sellosaurus' body was heavier at the front than at the back, so it was most comfortable when it was walking on all fours. When it stopped to feed, *Sellosaurus* probably reared up on its hind legs to reach juicy leaves. At the end of its fairly long neck, *Sellosaurus* had a small, flat head. Its slender teeth had coarse, ridged edges. *Sellosaurus* raked off leaves and held them in its cheeks before swallowing them. Then the food was probably ground down by stones in the dinosaur's stomach.

FIVE-FINGERED HANDS

Sellosaurus had long hands with five fingers. On each thumb it had a huge claw. These curved claws probably gave *Sellosaurus* a life-saving weapon when it was attacked by meat-eaters. It reared up on its hind legs and lashed out with its dagger-like thumbs. It also used its thumbs to hook branches closer to its mouth as it fed.

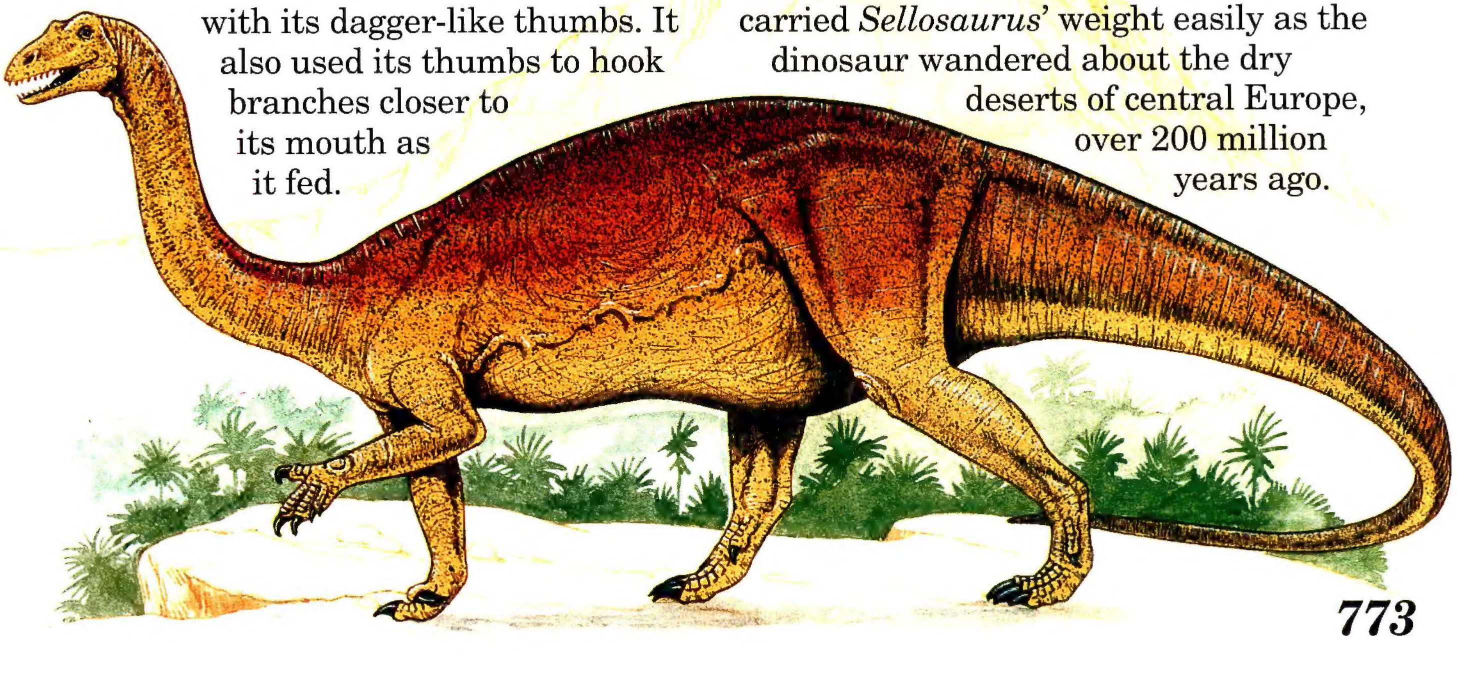


MONSTER FACTS

- **NAME:** *Sellosaurus* (sell-o-saw-rus) means 'saddle lizard'
- **SIZE:** up to about 7m long
- **FOOD:** plants
- **LIVED:** about 210 million years ago during the Late Triassic Period in south-west Germany

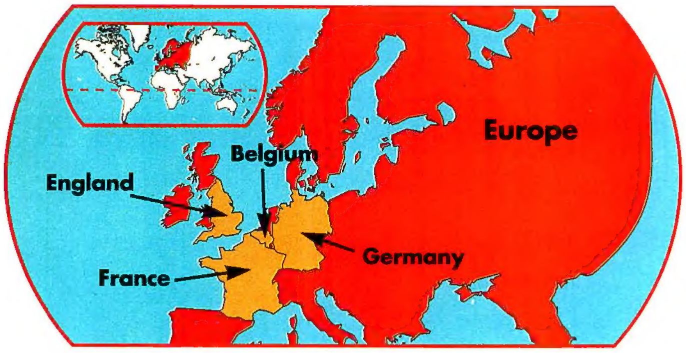
LONG TAIL

At the end of its bulky body, *Sellosaurus* had a long, tapering tail which trailed along the ground. Its narrow, five-toed feet carried *Sellosaurus*' weight easily as the dinosaur wandered about the dry deserts of central Europe, over 200 million years ago.



Dinosaurs from Europe

Dinosaurs were first dug up and named in Europe, and this is where many amazing fossil discoveries were made during the last century.



During the Age of the Dinosaurs, the climate in Europe gradually changed from hot and dry to warm and damp. An area of winding rivers, shallow lakes, marshes and patches of dry land spread across south-east England into France, Belgium and Germany. Plants grew almost everywhere.

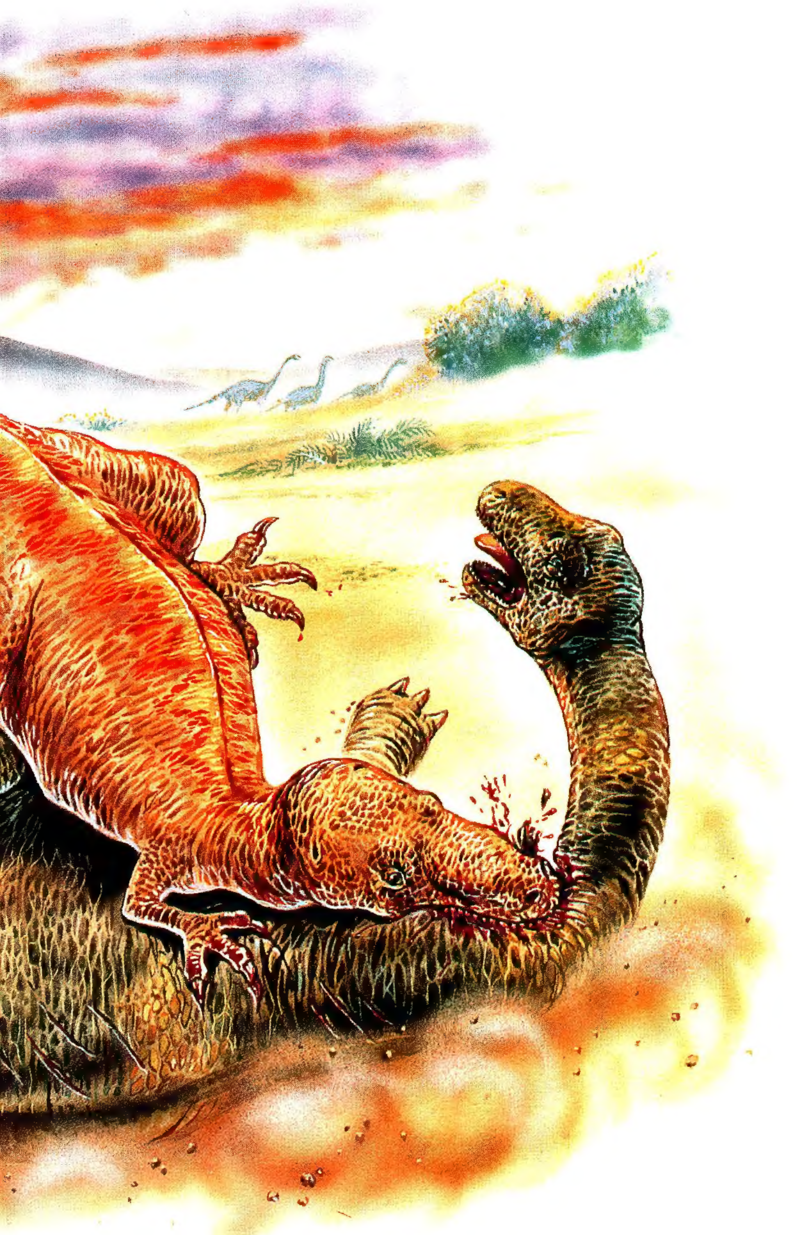
MUNCHING IN THE MARSHES

Across this lush green landscape wandered herds of huge, four-legged, herbivorous dinosaurs – the sauropods. They included *Cetiosauriscus, Ornithopsis, Cetiosaurus,* and the 'monster reptile' *Pelorosaurus.* Like their North American cousin, *Diplodocus,* most of these sauropods had tiny heads with small, peg-like teeth, and huge, barrel-shaped bodies. They reared up to rake in plants far above the ground, then plodded on to find fresh feeding areas.

BIG EGG

Massive dinosaurs probably laid massive eggs. Some huge fossilized reptile eggs were found in Aix-en-Provence, France. Each egg was 30cm long – 60 times the size of a hen's egg.

When dinosaurs roamed across Europe the landscape was similar to tropical countries today.



A European scene 140 million years ago: vicious *Megalosaurus* attacks the peaceful plant-eater *Cetiosauriscus*.

MEAT-EATERS TOO

The sauropods did not have it all their own way. Europe also had its share of terrible meat-eating dinosaurs, the carnosaurs.

THE MEGA-REPTILE

Megalosaurus, or 'big reptile' was a famous carnosaur. It was the first dinosaur to be named and scientifically described, by William Buckland in 1824. Its fossils were first found in Oxfordshire, England, in the 1600s. At that time they were thought to be part of a giant man.

CARNOSAUR KILLER

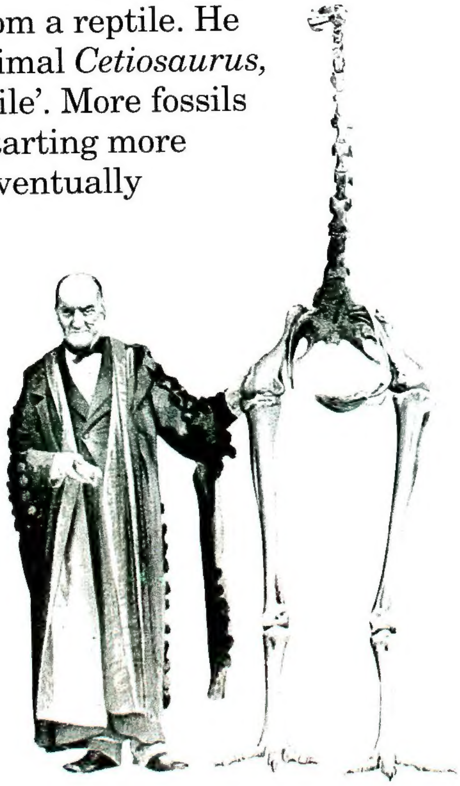
Megalosaurus was a close relative of *Allosaurus* from North America. It was about 9m long, 3m tall, and probably weighed well over 1 tonne. Its neck was short and muscular, and its large head had powerful jaws and saw-edged fangs.

FAST WALKER

Fossil footprints show that dinosaurs like *Megalosaurus* moved on two legs, with their toes pointing slightly in, and their heavy tails swinging. They ambled along at about 7km/h.

WHAT DO YOU MEAN, A WHALE?

The fossils of the European dinosaur *Cetiosaurus* were the subject of an early argument about dinosaur bones. Some fossils were found in Oxfordshire, England, in the 1830s. William Buckland and the French expert, Georges Cuvier, thought they came from a whale, which is a mammal. Ten years later, palaeontologist Richard Owen decided that the bones were from a reptile. He named the animal *Cetiosaurus,* or 'whale-reptile'. More fossils were found, starting more arguments. Eventually the biologist Thomas Huxley said that *Cetiosaurus* was a dinosaur.



Richard Owen (right), the British scientist who first described *Cetiosaurus*.

FAMOUS FOSSILS

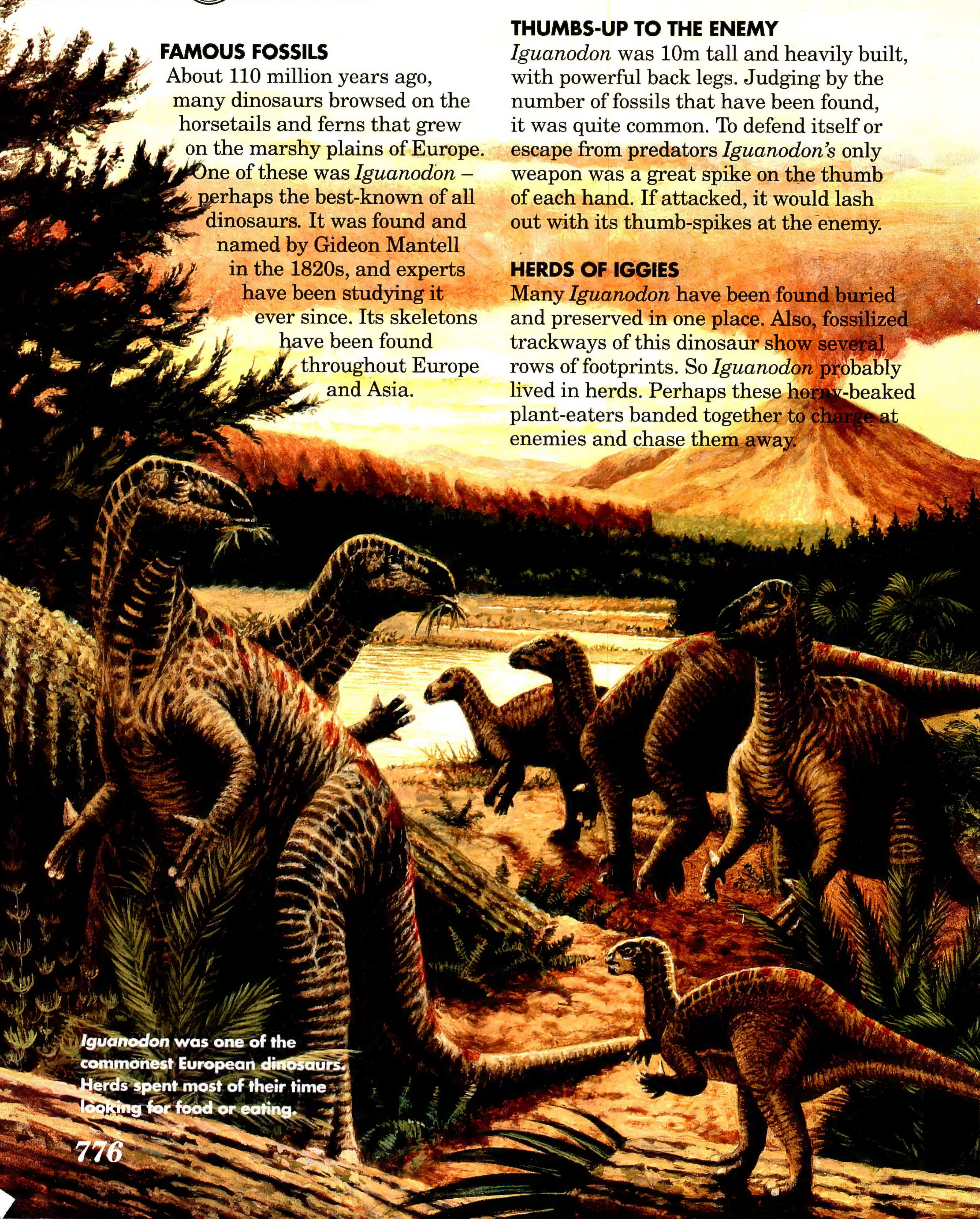
About 110 million years ago, many dinosaurs browsed on the horsetails and ferns that grew on the marshy plains of Europe. One of these was *Iguanodon* – perhaps the best-known of all dinosaurs. It was found and named by Gideon Mantell in the 1820s, and experts have been studying it ever since. Its skeletons have been found throughout Europe and Asia.

THUMBS-UP TO THE ENEMY

Iguanodon was 10m tall and heavily built, with powerful back legs. Judging by the number of fossils that have been found, it was quite common. To defend itself or escape from predators *Iguanodon's* only weapon was a great spike on the thumb of each hand. If attacked, it would lash out with its thumb-spikes at the enemy.

HERDS OF IGGIES

Many *Iguanodon* have been found buried and preserved in one place. Also, fossilized trackways of this dinosaur show several rows of footprints. So *Iguanodon* probably lived in herds. Perhaps these horny-beaked plant-eaters banded together to charge at enemies and chase them away.



***Iguanodon* was one of the commonest European dinosaurs. Herds spent most of their time looking for food or eating.**

TWO TYPES OF IGGY?

In some places different-sized *Iguanodon* skeletons have been found. Some were 6m long, and others 10m long. Some scientists think they may be two different kinds of *Iguanodon*. Others believe that they are the same type of *Iguanodon*, but that the larger skeletons were male, and the smaller ones were female.

SPEEDING AROUND THE SOUTH

The hypsilophodonts were smallish, two-legged, plant-eating dinosaurs. The best known is *Hypsilophodon* itself. About the size of a large dog, it was a nimble, beaked plant-eater. This dinosaur was nipping around southern England at about the same time as *Iguanodon*.

AN EARLY BONE-HEAD

Like most other continents, Europe had its share of other dinosaur groups. *Yaverlandia* was a very early pachycephalosaur, or bone-head dinosaur. It lived 110 million years ago on the Isle of Wight. It is known only from part of a skull, which is slightly thickened, with two rounded bulges on the top.

SPINY HIPS

There were several types of stegosaur in Europe. One of the very first was *Lexovisaurus*. It lived 160 million years ago in Oxfordshire, England. The plated dinosaur *Dacentrurus* was a stegosaur described by Richard Owen in 1875. It had large bony plates and a pointed tail.

EURO-ARMOUR

Two early armoured dinosaurs lived in Europe, but apparently nowhere else. One was *Scelidosaurus*, from Dorset. It had a beak and rows of bony spines along its back. The other was *Emausaurus* from the Early Jurassic in Germany.

This eland herd in Africa finds safety in numbers just as *Iguanodon* did millions of years ago.

HALF SKELETONS

Hylaeosaurus is the earliest known nodosaur ('lumpy reptile'). The front half of its skeleton, with rows of bony plates along its back, was found in Sussex, England.

THE FINDS GO ON

Today, many exciting discoveries are being made in places like China, southern Australia, and Alaska. But new Euro-dinos still hit the headlines. So if you go for a country walk anywhere in Europe, keep your eyes open, and never give up.

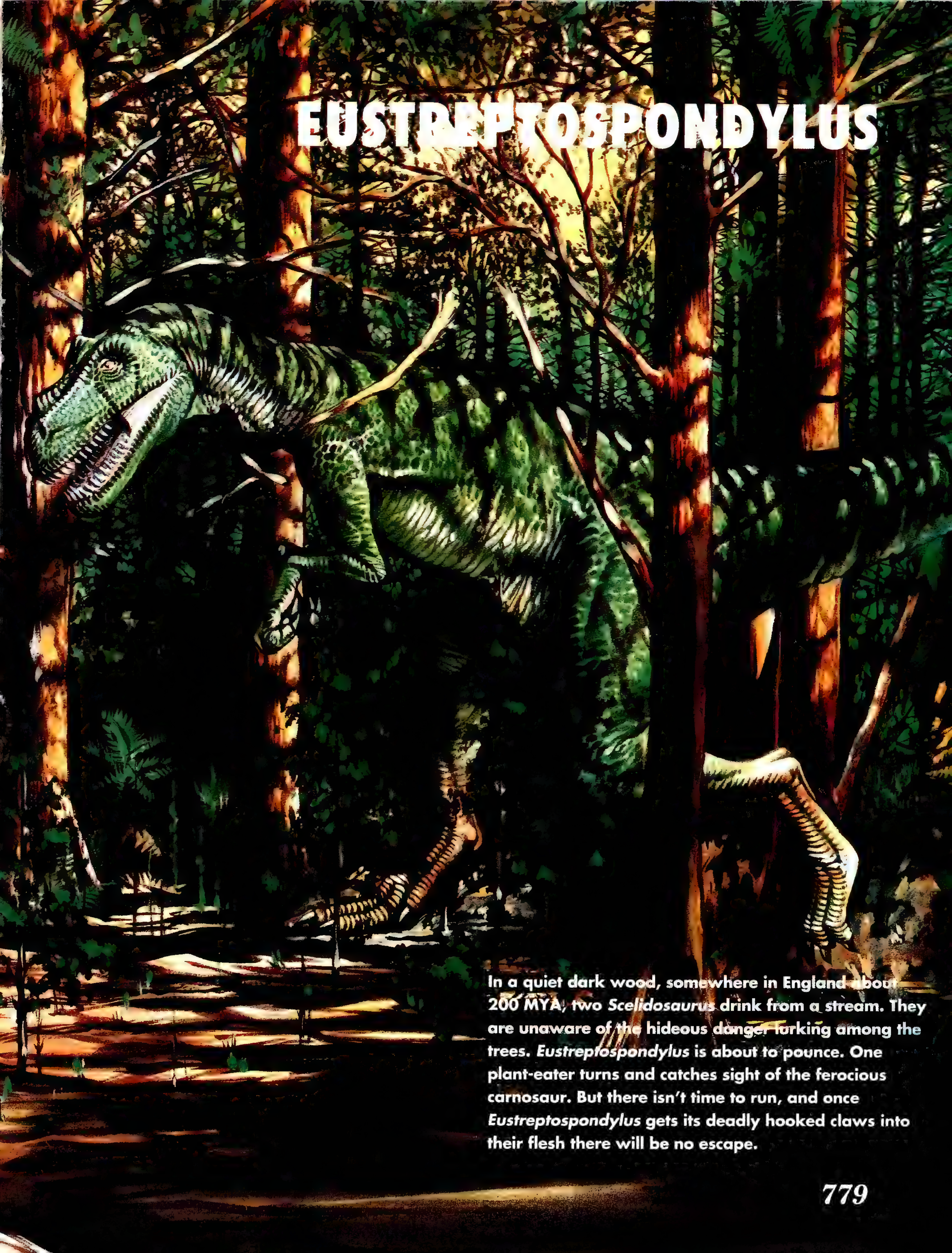
Is it true that male and female animals look different?

Yes, some male animals look different from the females. Male elephant seals are much bigger than the females. Red deer stags (males) have antlers. But hinds (females) do not. Sometimes the two sexes are different colours. Where a group of *Iguanodon* skeletons has been found together, there seem to be two different types. One is larger, with slightly different hands, feet, head and hips. Some scientists think that they are males and females of the same species.

Male (above) and female elephant seals.

GIANTS OF THE PAST

EUSTREPTOSPONDYLUS



In a quiet dark wood, somewhere in England about 200 MYA, two *Scelidosaurus* drink from a stream. They are unaware of the hideous danger lurking among the trees. *Eustreptospondylus* is about to pounce. One plant-eater turns and catches sight of the ferocious carnosaur. But there isn't time to run, and once *Eustreptospondylus* gets its deadly hooked claws into their flesh there will be no escape.

3-D Gallery 42

TRICERATOPS V DASPLETOSAURUS

Terror of Cretaceous times *Daspletosaurus* has snatched a baby *Triceratops* from its herd. The furious mother leads the others in a charge against the greedy predator. As the *Triceratops* mother smashes into *Daspletosaurus*, the baby flies out of its jaws.

Crests

Dinosaurs with crests wanted to be seen. Why were they such show-offs?

Crested dinosaurs often had eye-catching lumps, bumps or spikes on their heads. Just as lizards show off with bright colours, and birds give feathery displays, some dinosaurs made a spectacle of themselves with their odd-shaped crests.

CAUSING A SCENE

Why did they want to draw attention to themselves with their crests? Crested dinosaurs often lived in herds and, like other sociable animals today, they communicated with the other members of the group. To do this they first had to attract the attention of other dinosaurs in the herd. If you wanted to stand out in a crowd you might wear a tall hat. Instead of hats, crested dinosaurs had lumps on their heads.

Left: the hadrosaur *Saurolophus*. Hadrosaurs' brightly coloured crests helped them to identify one another.

Scientists think that only the male *Oviraptor* (left) had a crest.

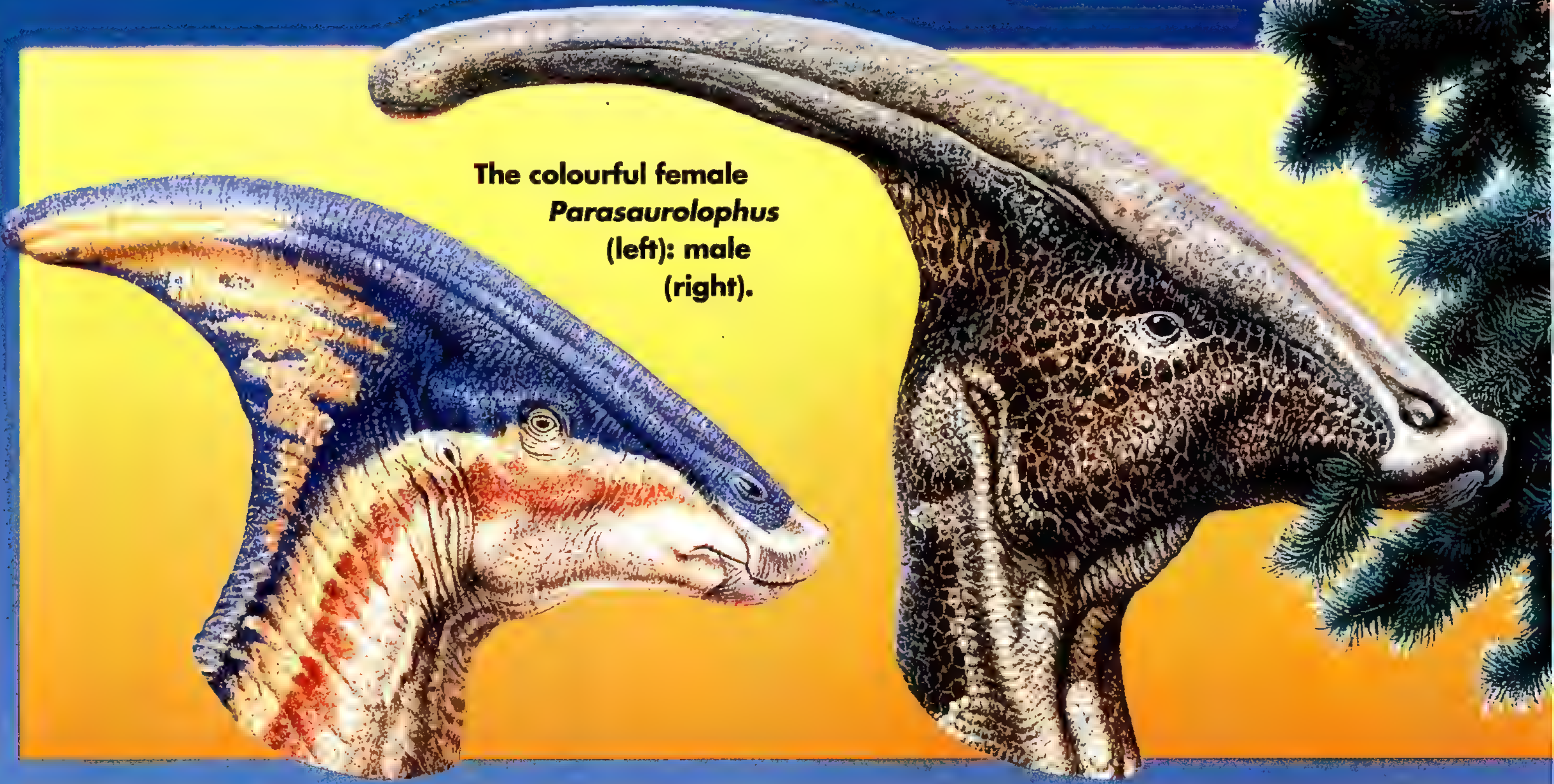
CRESTED EGG THIEF

Oviraptor was a crested dinosaur that stole eggs from the unguarded nests of hadrosaurs such as *Saurolophus*. Not all the *Oviraptor* skulls that have been found have crests. Scientists think that only the males had crests. *Oviraptor* could tell at a glance whether another of its species was male or female just by looking at its crest.

A male bird of paradise displays its colourful feathers to a female.

FINDING YOUR FAMILY

Imagine living in a herd, surrounded by dinosaurs that all look the same. It would be easy to get separated from your family. Crests helped dinosaurs to identify other members of their family group. The young hadrosaurs had small bumps while adult males had fully-grown head crests.



The colourful female *Parasaurolophus* (left): male (right).

LOOKING THEIR BEST

At mating time, male birds try to make themselves look as impressive as possible, in order to attract a female. They fluff up their plumes and display their colourful feathers. Male dinosaurs may have used their crests in a similar way.

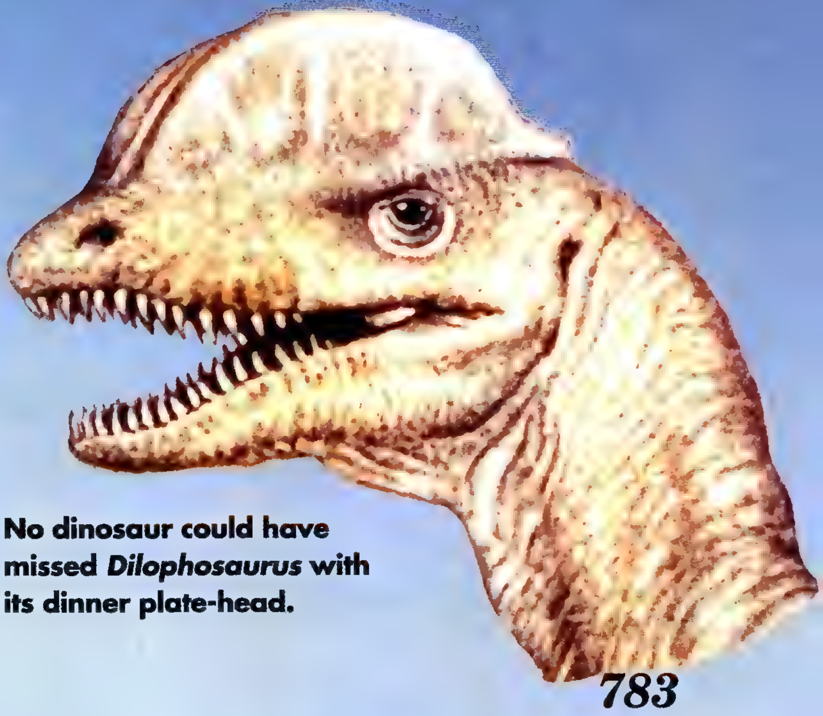
TWO-RIDGED REPTILE

Some dinosaurs had very odd-looking crests. *Dilophosaurus* was named after the strange lump on its head. Its name means 'two-ridged reptile' because it had two thin, high ridges that ran along the length of its skull. It probably used its crest as a signal to friends to tell them where it was, and to frighten off any enemies.

IT'S A FACT

THE DINOSAUR THAT CHANGED ITS CREST!

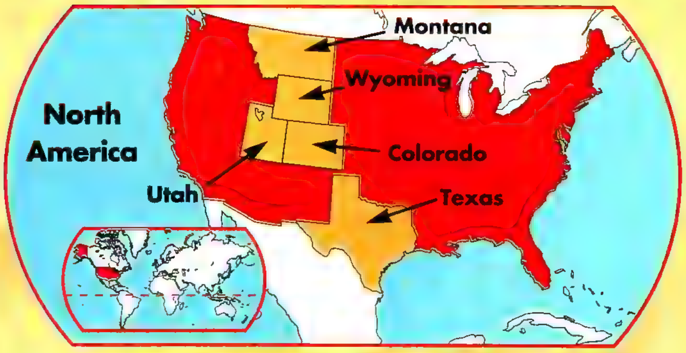
In many dinosaur books *Tsintaosaurus* is shown with a spiky crest on its head. Models of this Chinese dinosaur have been put together showing a bone sticking up from *Tsintaosaurus*' nose. Palaeontologists now know that this long, thin bone actually lay flat along the dinosaur's snout. They still think *Tsintaosaurus* had some sort of crest but don't know what it looked like.



No dinosaur could have missed *Dilophosaurus* with its dinner plate-head.

Expeditions: NORTH AMERICA

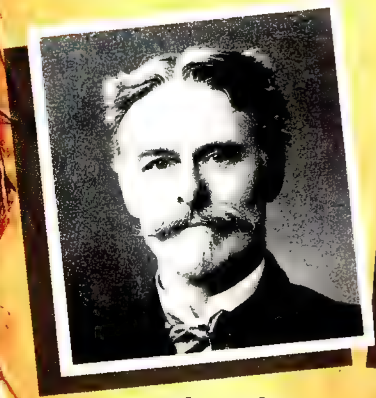
The huge number of dinosaurs that lived in North America left a wealth of bones for the fossil hunters to find.



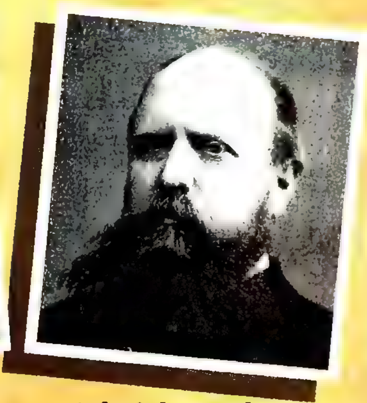
The rush to collect dinosaur fossils began in the 1870s. The biggest collectors in North America were two experts who were deadly rivals. Their race to find and name the best fossils was known as the Bone Wars.

THE BONE WARS

Edward Cope and Othniel Marsh discovered major new bone beds in the American midwest. But they were firm enemies and often gave different names to the same animal. Marsh and Cope paid teams of bone collectors to dig for them. They found tons of dinosaur fossils in Como Bluff, Wyoming, at Judith River, Montana, and Canyon City and Morrison in Colorado. Some of the bones were the first whole skeletons of the giant dinosaurs.



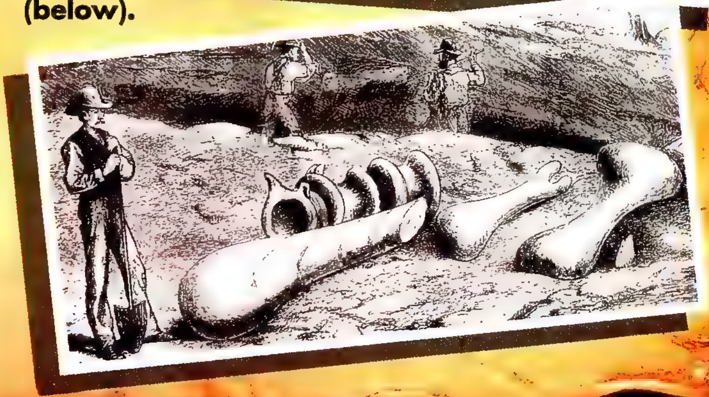
Edward Cope



Othniel Marsh

Eating in the foodstore at camp in Como Bluff in the 1890s (right).

A 1878 drawing of dinosaur bones (below).



THE BONE WARS

- **Fought between Edward Cope and Othniel Marsh**
- **In Montana, Colorado and Wyoming**
- **From 1877-89**
- **American expeditions**
- **Major finds – *Allosaurus, Apatosaurus, Camarasaurus, Stegosaurus***

JOHN BELL HATCHER

- **Lance Creek, Wyoming**
- **1888-92**
- **American expeditions**
- **Major find – *Triceratops***

John Bell Hatcher

HUNTING THE HORNED ONES

In 1888 John Bell Hatcher visited Wyoming and discovered one of the strangest dinosaurs yet. In a deep canyon he found a large horn and a gigantic skull, which he sent to Marsh. His discovery was *Triceratops*, a three-horned dinosaur as heavy as a bull elephant and as menacing as a rhinoceros. Over the next four years he found the skulls and skeletons of 50 more horned dinosaurs.

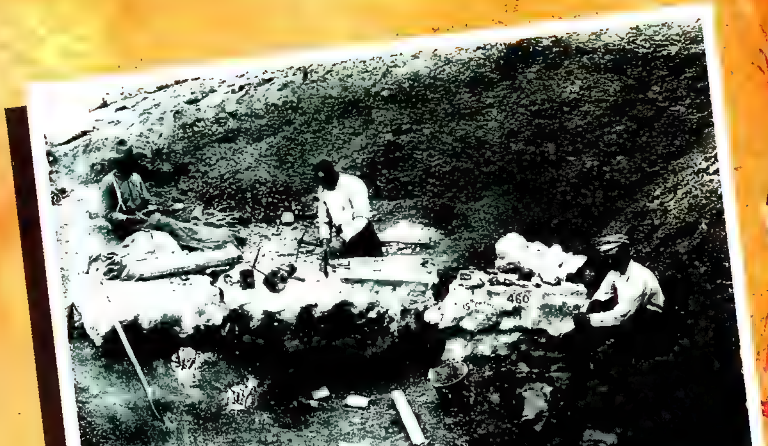
Four American dinosaur hunters in 1895 (below), in front of their covered wagon.

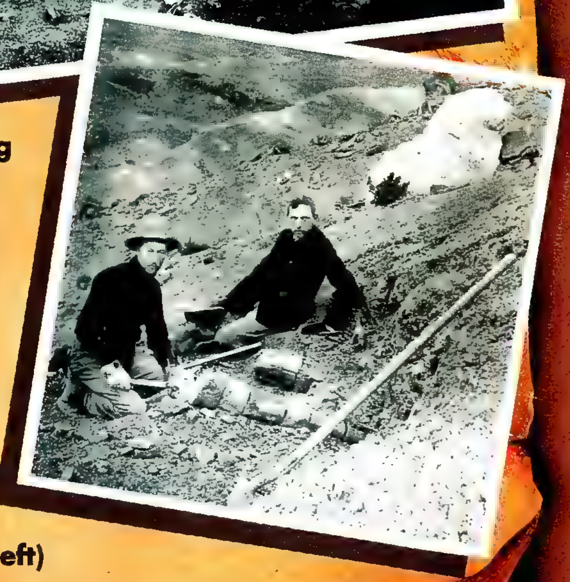
BARNUM BROWN

- **Hell Creek, Montana**
- **1902-3**
- **American expeditions**
- **Major find – *Tyrannosaurus rex***

DIGGING OUT 'THE KING'

Barnum Brown's discovery of the first *Tyrannosaurus rex* thrilled the scientific world. Brown sent an almost complete skeleton of the mightiest dinosaur meat-eater to the American Museum of Natural History in New York. Parts of the body were so heavy he had to build an extra-strong sledge to carry them. The sledge was dragged by a team of four horses to the nearest railway 200km away.





Above: covering giant dinosaur bones with protective plaster bandages.

Right: Barnum Brown (on the left) excavating a *Diplodocus* skeleton.

CHARLES STERNBERG

- **Lusk, Wyoming**
- **1908**
- **American expedition**
- **Major find – dinosaur skin impression**

Charles Sternberg (on the right) fossil-hunting with Lawrence Lambe.

SKIN OF A DUCKBILL

A fossil collector and his three sons were the first to uncover dinosaur skin. The Sternberg family's discovery of a fossilized duckbill with impressions of its skin was very important. It was bought by the American Museum of Natural History.

EARL DOUGLASS

- **Carnegie Quarry, Utah**
- **1908-24**
- **American expeditions**
- **Major finds – *Apatosaurus, Diplodocus,* young *Camarasaurus***

Removing fossil bones by horse-drawn sledge at Carnegie Quarry, Utah.

THE BIGGER THE BETTER

The American millionaire Andrew Carnegie paid for an expedition to track down a fossil dinosaur 'as big as a barn'. Earl Douglass supplied Carnegie's museum in Pittsburgh with the skeleton of an *Apatosaurus*. It was the largest and most complete skeleton ever found. Douglass also discovered the best example of a giant *Diplodocus* ever found.

Earl Douglass in front of the *Diplodocus* skeleton he found at Carnegie Quarry.

ROLAND T BIRD

- **Glen Rose, Texas**
- **1938**
- **American expedition**
- **Major find – first sauropod tracks**

HOT ON THE TRAIL

In 1938 a sharp-eyed collector made a remarkable discovery in a dried-up river bed. Bird worked for the American Museum of Natural History. His find proved that sauropods could walk on all four legs. Until then some scientists had believed that they swam. As Bird dug further he made another exciting discovery. He uncovered the tracks of another dinosaur which seemed to be following the sauropods.

JOHN OSTROM

- **Bridger, Montana**
- **1964-66**
- **American expeditions**
- **Major find – *Deinonychus***

JOHN HORNER & ROBERT MAKELA

- **Choteau, Montana**
- **1978 onwards**
- **American expeditions**
- **Major finds – *Maiasaura* & *Orodromeus***

John Ostrom using a jack hammer during excavation work at the Montana site.

THE 'TERRIBLE CLAW'

In 1964 John Ostrom came across dinosaur claws reaching out of the rock. The three-toed, grasping foot that Ostrom uncovered for Yale University was unlike any other yet discovered. It was not bird-like. Instead it had a fearsome, sickle-shaped, clawed middle toe. So Ostrom named the newly discovered monster *Deinonychus,* which means 'terrible claw'.

EGG MOUNTAIN

Years of hard digging in hummocky grassland resulted in a first glimpse of dinosaur family life. Working for Princeton University's Museum of Natural History, Horner and Makela uncovered a fossilized nest containing the bones of 15 baby dinosaurs. These *Maiasaura* babies were the first to be found in a nest. The two scientists went on to discover 300 more *Maiasaura* eggs. One area revealed 10 nests at different levels. They contained a large number of eggs laid by *Orodromeus.* The site became known as Egg Mountain.

John Horner (above), joint discoverer of *Maiasaura* and *Orodromeus* eggs at Egg Mountain.

Above: the 1965 camp at Bridger, Montana.

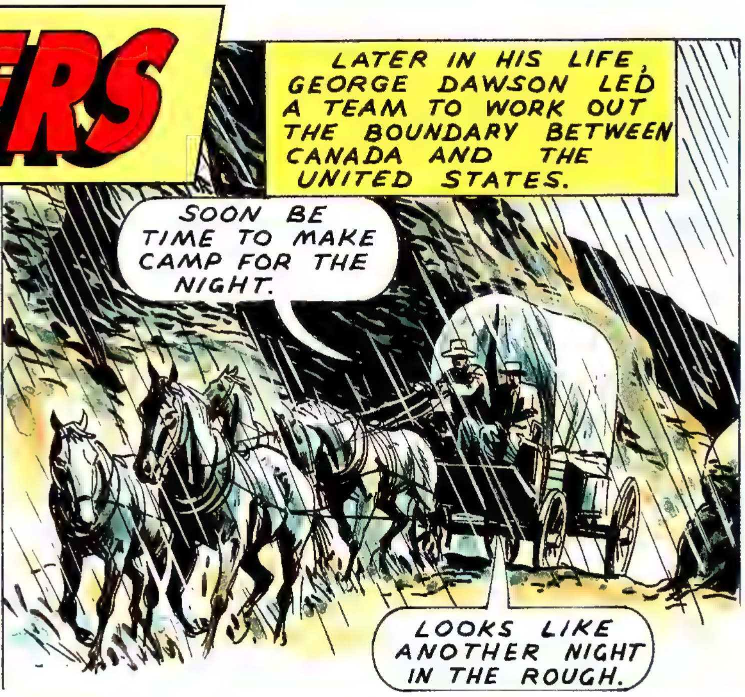
Right: the Ostrom team heaves a large plastered dinosaur bone uphill.

TRAIL-BLAZERS

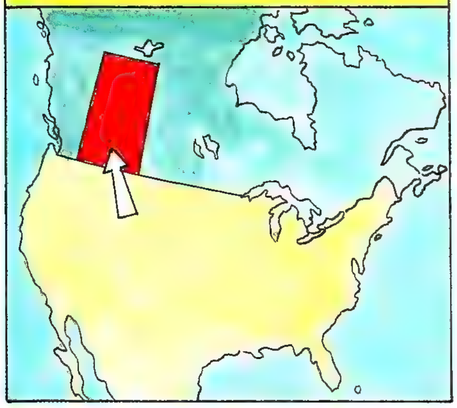
MANY DINOSAURS WERE FOUND IN CANADA IN THE NINETEENTH CENTURY. GEORGE MERCER DAWSON'S FATHER, FIRST PRINCIPAL OF CANADA'S McGILL UNIVERSITY, WAS ONE OF CANADA'S GREATEST GEOLOGISTS. HE HAD HIGH HOPES FOR HIS DISABLED SON.

CONGRATULATIONS, SON. WELL DONE!
THANKS, DAD.

LATER IN HIS LIFE, GEORGE DAWSON LED A TEAM TO WORK OUT THE BOUNDARY BETWEEN CANADA AND THE UNITED STATES.

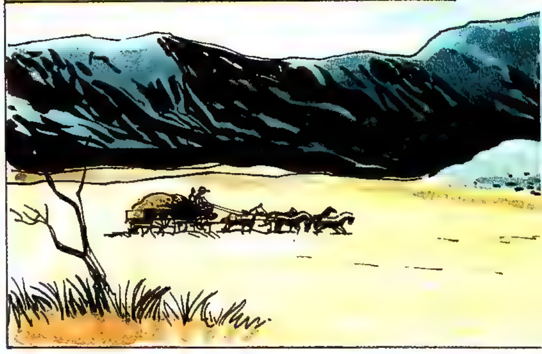

SOON BE TIME TO MAKE CAMP FOR THE NIGHT.
LOOKS LIKE ANOTHER NIGHT IN THE ROUGH.

LATER, TYRRELL LED A TEAM TO ALBERTA WHERE THEY EXPLORED THE VALLEY OF THE RED DEER RIVER.



ONE DAY THEY MADE AN EXTRAORDINARY DISCOVERY...

THE MEN DUG THE FOSSIL SKULL FROM THE GROUND WITH THEIR BARE HANDS AND SENT IT BACK TO CALGARY BY WAGON, FROM WHERE IT WAS SHIPPED BACK TO ONTARIO.



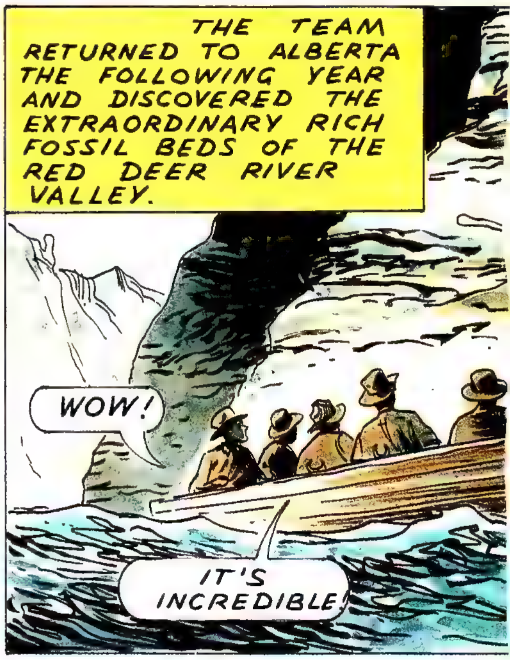
... AND THEY DID. BUT AFTER ONLY 13 KM THE BOAT SANK.

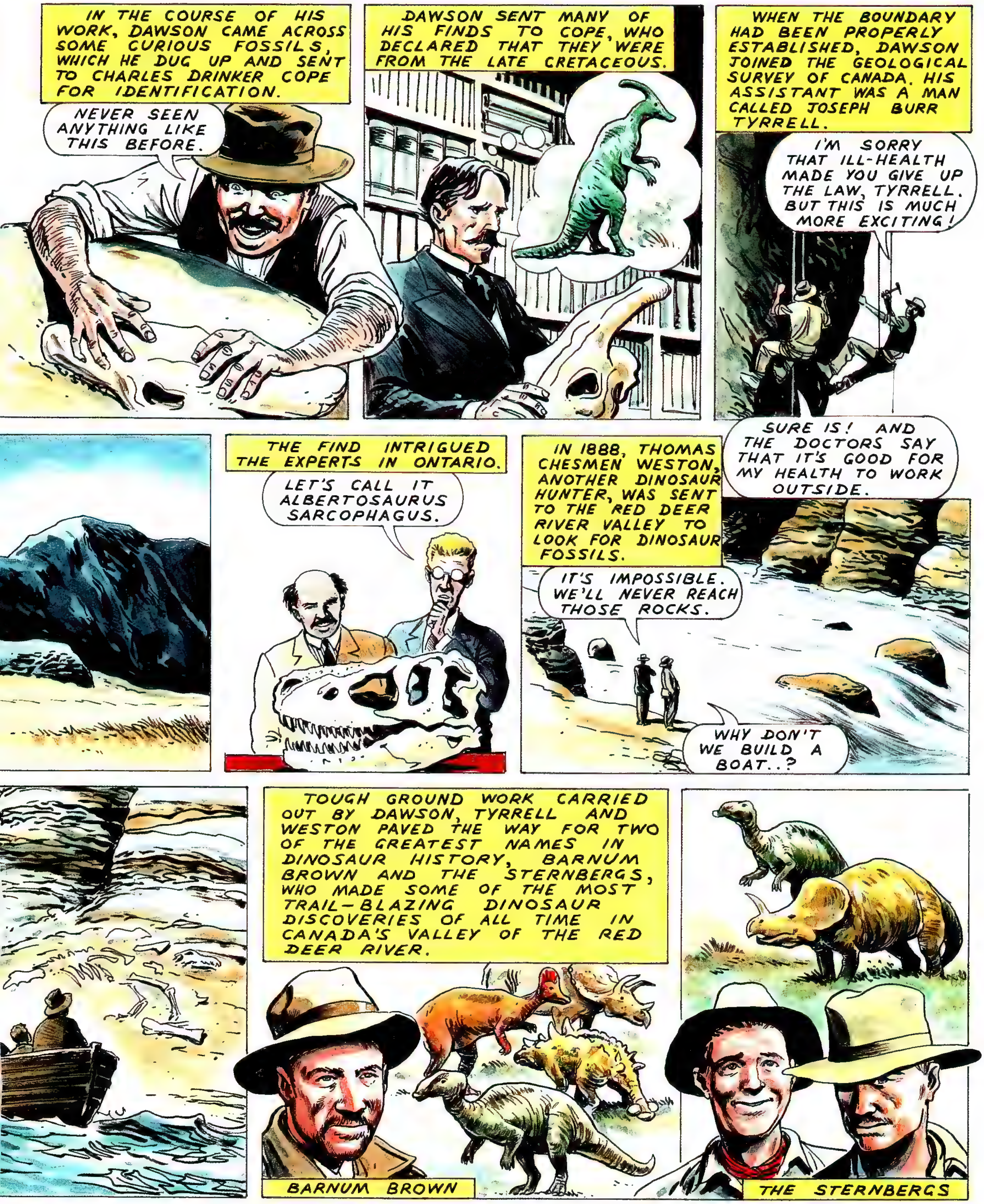
AAARGH!
HELP!
I CAN'T SWIM!

THE MEN MANAGED TO SCRAMBLE ASHORE AND MADE THEIR WAY TO A NEARBY FARMHOUSE.

YOUR BOAT WAS OBVIOUSLY SHODDILY MADE AND YOU CERTAINLY DON'T KNOW THE WAYS OF THE RIVER.
CAN YOU HELP US?
YES. GET YOURSELVES A PROPER BOAT, COME BACK NEXT YEAR AND I WILL TAKE YOU UP THE RIVER MYSELF.

THE TEAM RETURNED TO ALBERTA THE FOLLOWING YEAR AND DISCOVERED THE EXTRAORDINARY RICH FOSSIL BEDS OF THE RED DEER RIVER VALLEY.


WOW!
IT'S INCREDIBLE!


IN THE COURSE OF HIS WORK, DAWSON CAME ACROSS SOME CURIOUS FOSSILS, WHICH HE DUG UP AND SENT TO CHARLES DRINKER COPE FOR IDENTIFICATION.
NEVER SEEN ANYTHING LIKE THIS BEFORE.
DAWSON SENT MANY OF HIS FINDS TO COPE, WHO DECLARED THAT THEY WERE FROM THE LATE CRETACEOUS.
WHEN THE BOUNDARY HAD BEEN PROPERLY ESTABLISHED, DAWSON JOINED THE GEOLOGICAL SURVEY OF CANADA. HIS ASSISTANT WAS A MAN CALLED JOSEPH BURR TYRRELL.
I'M SORRY THAT ILL-HEALTH MADE YOU GIVE UP THE LAW, TYRRELL. BUT THIS IS MUCH MORE EXCITING!
SURE IS! AND THE DOCTORS SAY THAT IT'S GOOD FOR MY HEALTH TO WORK OUTSIDE.
THE FIND INTRIGUED THE EXPERTS IN ONTARIO.
LET'S CALL IT ALBERTOSAURUS SARCOPHAGUS.
IN 1888, THOMAS CHESMEN WESTON, ANOTHER DINOSAUR HUNTER, WAS SENT TO THE RED DEER RIVER VALLEY TO LOOK FOR DINOSAUR FOSSILS.
IT'S IMPOSSIBLE. WE'LL NEVER REACH THOSE ROCKS.
WHY DON'T WE BUILD A BOAT..?
TOUGH GROUND WORK CARRIED OUT BY DAWSON, TYRRELL AND WESTON PAVED THE WAY FOR TWO OF THE GREATEST NAMES IN DINOSAUR HISTORY, BARNUM BROWN AND THE STERNBERGS, WHO MADE SOME OF THE MOST TRAIL-BLAZING DINOSAUR DISCOVERIES OF ALL TIME IN CANADA'S VALLEY OF THE RED DEER RIVER.
BARNUM BROWN
THE STERNBERGS

Improve and test your knowledge with...

DINO Fact File

Climb down *Diplodocus*' neck, answering the questions as you go.

Death throes

A Coelophysis skeleton was found with its neck curving backwards, as though the dinosaur had died in agony! But the cause was not so sinister. When the dinosaur died, its neck muscles dried and shortened, making the neck curve backwards.

3 Which dinosaur lost its crest?

a) *Tsintaosaurus*
b) *Parasaurolophus*
c) *Corythosaurus*

4 In what shape did *Orodromeus* lay its eggs?

a) a triangle
b) a square
c) a spiral

5 What did *Eustreptospondylus* eat?

a) small fish
b) huge chunks of meat
c) ferns and reeds

6 Which of these dinosaurs lived at the same time as *Daspletosaurus*?

a) *Triceratops*
b) *Diplodocus*
c) *Scelidosaurus*

7 Where were dinosaurs first found?

a) in Asia
b) in America
c) in Europe

8 *Eustreptospondylus* was first thought to be

a) a bird
b) *Megalosaurus*
c) *Diplodocus*

9 What was used to carry *T rex*' skeleton to a railway?

a) four horses
b) ten camels
c) three lorries

10 Why did the discovery of *Opisthocoelicaudia* surprise scientists?

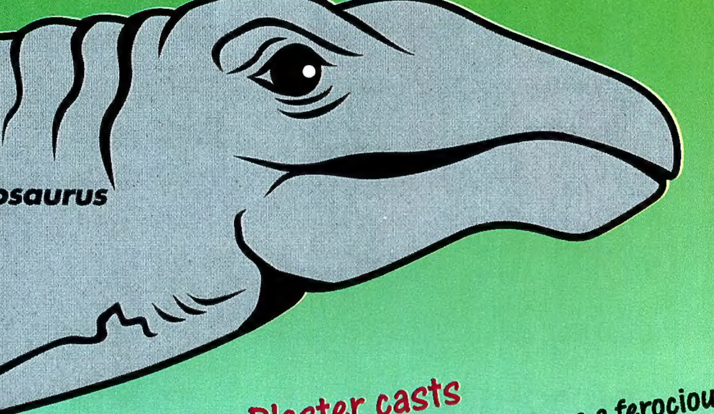
a) it lived later than most other sauropods
b) it had large feathers on its head
c) it was smaller than a mouse

Topping the trees

Plant-eating Brachiosaurus was one of a family of sauropods which had front legs longer than their back legs. This may have helped these dinosaurs reach the tastiest shoots at the tops of the trees that they browsed in.

Room for living

There would be about 980 million species of plants and animals (including dinosaurs) on Earth if none had died out. But about 99.5% of species that once existed are now extinct – there simply would not be enough room on Earth for them all!



2 *Leptoceratops* means:
- a) slim-horned face
- b) leper head
- c) leaping dinosaur

1 How did *Sellosaurus* move along?
- a) on two legs
- b) on four legs
- c) on its belly

Common rock

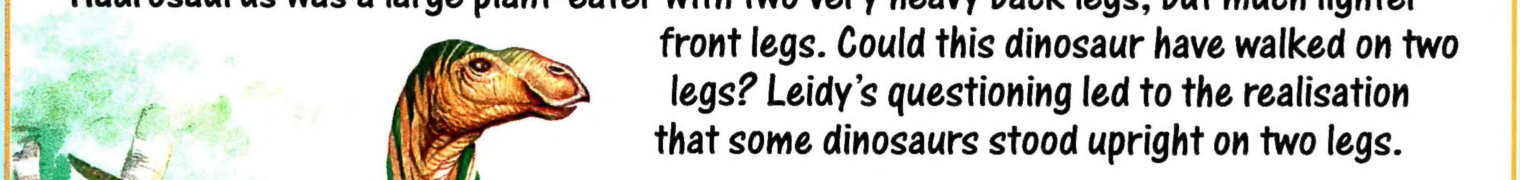
Most fossils, including dinosaur fossils, are found in sedimentary rock. This type of rock is found in many parts of the world.

Plaster casts

When you visit a dinosaur exhibition, you may see a ferocious-looking T rex skeleton, or a huge Diplodocus. But very often these displays are plaster casts of the original skeletons. There are not enough original skeletons for every museum to have one!

On all fours?

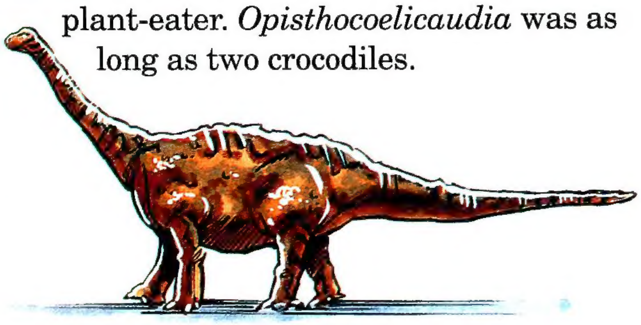
At the time Hadrosaurus was discovered scientists thought that all dinosaurs lumbered around on all four feet. But an American scientist, Joseph Leidy, was not so sure. Hadrosaurus was a large plant-eater with two very heavy back legs, but much lighter front legs. Could this dinosaur have walked on two legs? Leidy's questioning led to the realisation that some dinosaurs stood upright on two legs.



Hadrosaurus

OPISTHOCOELICAUDIA 75 MYA

Opisthocoelicaudia (oh-pis-thoe-seel-ih-kow-dee-a) was found in the Gobi Desert of Mongolia. The discovery of the headless skeleton surprised experts as most other sauropods lived millions of years before this plant-eater. *Opisthocoelicaudia* was as long as two crocodiles.

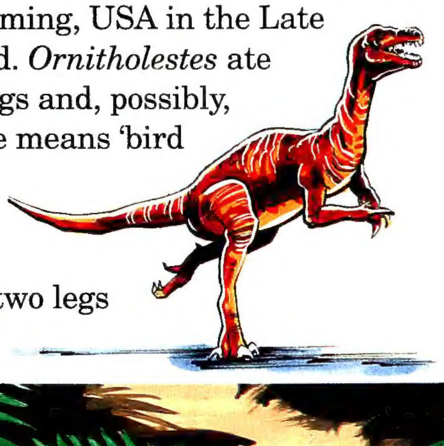


ORNATOTHOLUS 70 MYA

Ornatotholus (or-nat-oh-tho-lus) lived in the Red Deer River valley in Alberta, Canada. The name of this plant-eater means 'ornate dome'. *Ornatotholus* was a bone-headed dinosaur with a thick, low-domed skull. It walked on two legs and was about as big as a small car. *Ornatotholus* was once thought to be a female *Stegosaurus*.

ORNITHOLESTES 150 MYA

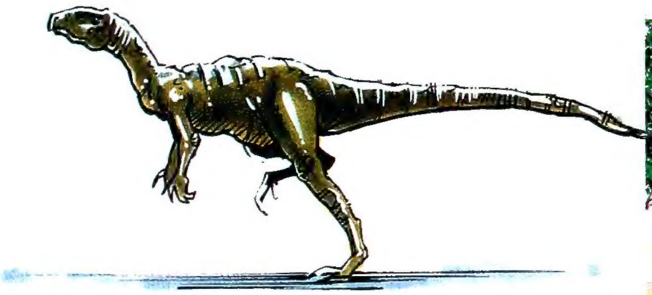
Ornitholestes (or-nith-oh-less-teez) was a meat-eating dinosaur the size of a large dog. It lived in Wyoming, USA in the Late Jurassic Period. *Ornitholestes* ate lizards and frogs and, possibly, birds. Its name means 'bird robber' and it may have moved fast enough on its two legs to catch birds.



ORNITHOMIMUS 70 MYA

A long tail stretched for more than half the length of this ostrich dinosaur. With its toothless, horny beak, *Ornithomimus* (or-nith-oh-mime-us) was about as long as a car and ate anything small enough to swallow. It probably enjoyed small mammals, lizards and frogs as well as fruits and berries. *Ornithomimus* was a nimble dinosaur built for speed, with long legs and light bones. Its name means 'bird mimic'.

ORODROMEUS 75 MYA

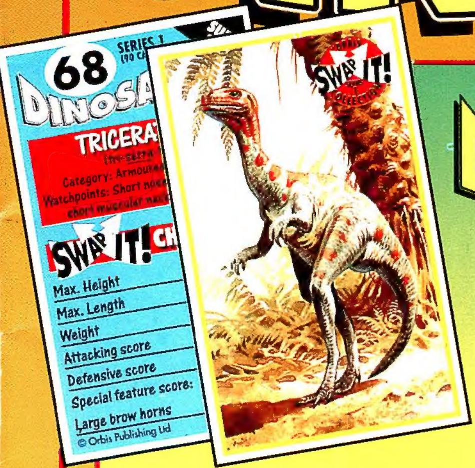


Orodromeus (oro-drome-ee-us) was discovered in Montana, USA, along with its eggs and young. The clutch of 19 eggs, laid in a perfect spiral, amazed scientists. With the help of a CAT scanner, (the machine used for making detailed X-rays of the human head) they were able to see the first ever dinosaur embryo inside one of the eggs. Experts think that the young probably left the nest almost as soon as they were hatched. *Orodromeus* means 'mountain runner' and this plant-eater could run very fast on its two long legs.

MYA = MILLION YEARS AGO

COMING IN PART 34 OF

DINOSAURS!



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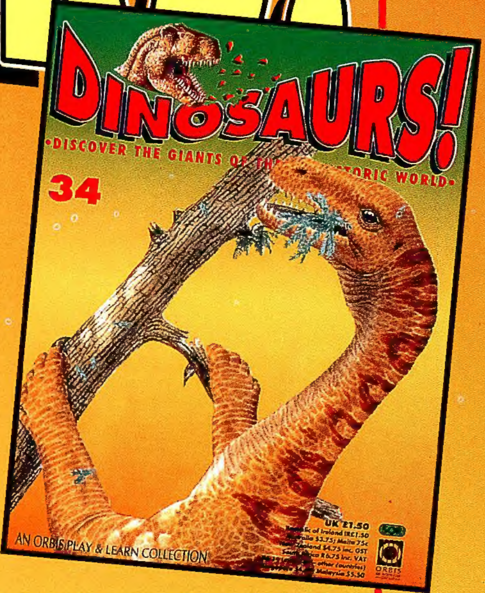
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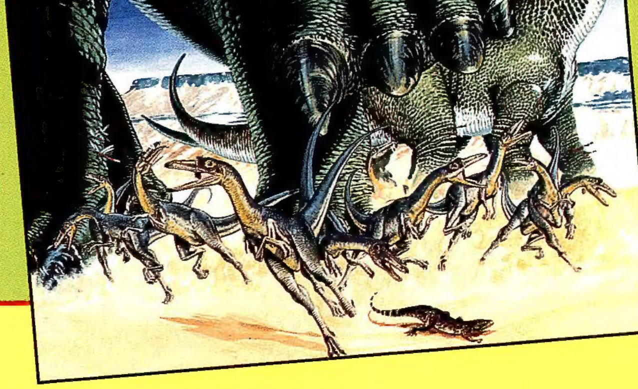

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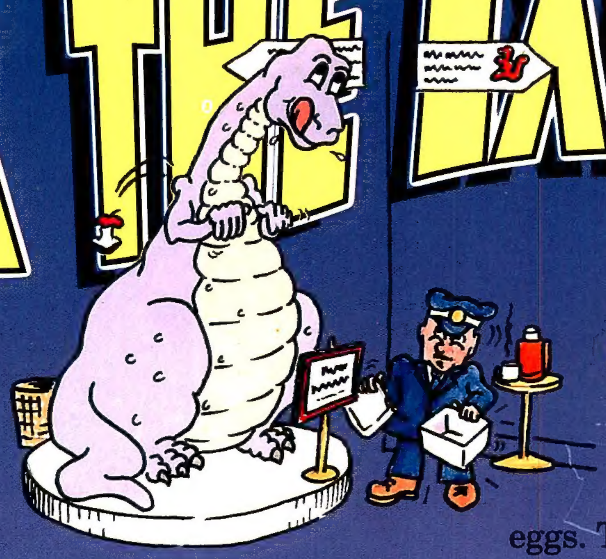
ANSWERS TO DINO FACT FILE QUESTIONS: 1.b 2.a 3.a 4.c 5.b 6.a 7.c 8.b 9.a 10.a

Dr. David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT



Will we ever see a living dinosaur?

Despite what you might see on TV, or at the cinema, or read in science fiction books, it is not realistic to think that we will ever see a living dinosaur. The one compensation for this is that we are pretty sure that birds are very close relatives to some of the small meat-eating dinosaurs (theropods), and are thought to be their living descendants. So perhaps when you see birds in the garden you are seeing a distant echo of the behaviour of small, active, theropod dinosaurs.

How long did Triceratops live?

We do not know how long dinosaurs lived. However, large reptiles today, like turtles, can live more than 100 years. Many big mammals, such as elephants and rhinos, live for 30 or 40 years. I imagine that *Triceratops* would have lived for quite a long time, perhaps as long as 30 years.

Did all dinosaurs lay eggs?

As far as we can tell, most dinosaurs laid eggs. The duckbilled and horned dinosaurs certainly laid eggs. Some scientists have suggested that sauropods did not lay eggs, and instead produced live young like mammals do. However, some very large eggs have been found in France, which experts think belong to a sauropod.

Did any dinosaur live in trees?

Fossils of tree-living creatures are very rare, so we do not know whether dinosaurs lived in trees. For many years the small ornithopod *Hypsilophodon* was thought to be a tree-living dinosaur because it was similar to tree kangaroos in south-east Asia. But scientists now think that this little animal did not live in trees, but ran about on land and lived more like a gazelle.

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